

REMARKS

Claims 1-16 and 28 are rejected. Claims 17-27 are withdrawn from consideration. Claims 1 and 28 have been amended. Claims 1-28 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

The basis for the amendment to claims 1 and 28 is found on page 3, lines 15-16 and page 5, line 6 of the specification as originally filed. The Amendment to the claims does not raise any new matter issues, as the limitations are expressly set forth within the original disclosure.

Rejection Under 35 U.S.C. §102(b) over Dorogushina et al.:

The Examiner has rejected claims 1, 2, 6 and 9-12 under 35 U.S.C. 102(b) as being anticipated by Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892). The Examiner maintains that Dorogushina et al., in the abstract teaches a cellulose acetate film comprising two layers: a gelatin sublayer to improve adhesion which is applied with acetone, ethanol and phthalic acid and a copying layer, also comprising gelatin and, as it is well known in the art as evidenced by Schor et al (1996 J. Cell Sci. 109:2581-2590), fibronectin is a protein which binds denatured collagen (a.k.a. gelatin), inherently, the entirety of the gelatin based film of Dorogushina would perform as a protein microarray element, reading on "a gelatin layer containing functional groups capable of binding biological probes" of claim 1. The Examiner further maintains that the improved adhesive gelatin sublayer of Dorogushina reads on "an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer" of claim 1 part (c), and the gelatin adhesive interlayer of claim 6 (elected species) and claim 9, the cellulose acetate film of Dorogushina reads on the support of claim 1 part (a) and the organic support of claim 2, the ethanol and acetone of Dorogushina reads on the "organic solvent or a mixture of solvents" of claim 10 and the acetone of claim 11 (elected species), and according to page 7 of the specification, an organic acid can act as dispersion aid, thus the phthalic acid of Dorogushina reads on the dispersing aid of claim 12. The Examiner indicates that the recitation "useful as a protein microarray" has not been given patentable weight because the recitation occurs in the preamble. The Examiner further indicates that Schor discloses a gelatin-agarose chromatography

to affinity purify fibronectin expressed in insect cells. The Examiner states that according to Schor, gelatin acts as a specific binder for fibronectin and therein gelatin inherently bears functional groups capable of specific binding biological probes, such as fibronectin. The rejection is respectfully urged as in error as specific binding is not an inherent property of gelatin, and the reference fails to disclose a protein microarray.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. Dorogushina relates to a photosensitive copying material

for gravure printing and fails to disclose a protein microarray as claimed by the instant invention.

Specifically, Dorogushina fails to disclose an adhesive interlayer that does not optically interfere with protein microarray applications. In addition, Dorogushina further fails to expressly disclose a gelatin layer containing functional groups capable of specific binding of biological probes, which would be useful as a protein microarray. Neither is the presence of functional groups in gelatin an inherent property capable of specific binding of biological probes. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. The present claims require specific binding, as a result of the functional groupings on the gelatin. With respect to the Examiners assertion that the phrase “useful as a protein microarray” has not been given patentable weight because the recitation occurs in the preamble, the claims now stand amended to include a protein microarray not disclosed by Dorogushina.

Since Dorogushina and Schor fail to teach, expressly or inherently, the use of a functionalized gelatin for specific binding of proteins, protein microarrays, or an interlayer that does not interfere with protein microarray applications, the reference fails to anticipate the present claims. The Applicants request that the Examiner reconsider and withdraw the rejection.

Rejection Under 35 U.S.C. §102(b) over Himmelmann et al.:

The Examiner has rejected claims 1, 2, 6, 9-10 and 12 under 35 U.S.C. 102(b) as being anticipated by Himmelmann et al. (US Patent 3480431). The Examiner maintains that Himmelmann teaches a cellulose acetate film comprising two layers: a gelatin adhesive layer applied with 3 % formalin and diisobutyl naphthalic-1-sulfonic acid and a grey layer, also comprising gelatin. The Examiner states that, since it is well known in the art and as evidenced by Schor et al (1996 J. Cell Sci. 109:2581-2590) that fibronectin is a protein which binds denatured collagen (a.k.a. gelatin), inherently, the entirety of the gelatin based film of Himmelmann would perform as a protein microarray element, reading on

"a gelatin layer containing functional groups capable of binding biological probes". The Examiner continues that the adhesive gelatin layer of Himmelmann reads on "an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer", the gelatin adhesive interlayer of claim 6 (elected species) and claim 9, the cellulose acetate film of Himmelmann reads on the support of claim 1 part (a) and the organic support of claim 2, the formalin solution of Himmelmann reads on the "organic solvent or a mixture of solvents" of claim 10, and, according to page 7 of the specification of the instant application, an organic acid can act as dispersion aid, thus the di-isobutyl naphthalic-1-sulfonic acid of Himmelmann reads on the dispersing aid of claim 12. The Examiner indicates that the recitation "useful as a protein microarray" has not been given patentable weight because the recitation occurs in the preamble. The Examiner further indicates that Schor discloses a gelatin-agarose chromatography to affinity purify fibronectin expressed in insect cells. The Examiner states that according to Schor, gelatin acts as a specific binder for fibronectin and therein gelatin inherently bears functional groups capable of specific binding biological probes, such as fibronectin. The rejection is respectfully urged as in error as specific binding is not an inherent property of gelatin, and the reference fails to disclose a protein microarray.

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a

crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. Himmelmann relates to a photographic material for a dry copying process and fails to disclose a protein microarray as claimed by the instant invention. Himmelmann also fails to disclose an adhesive interlayer that does not optically interfere with protein microarray applications. Himmelmann further fails to expressly disclose a gelatin layer containing functional groups capable of specific binding of biological probes, which would be useful as a protein microarray. Neither is the presence of functional groups in gelatin an inherent property capable of specific binding of biological probes. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. The present claims require specific binding, as a result of the functional groupings on the gelatin. With respect to the Examiners assertion that the phrase “useful as a protein microarray” has not been given patentable weight because the recitation occurs in the preamble, the claims now stand amended to include a protein microarray.

Since Himmelmann and Schor fail to teach, expressly or inherently, the use of a functionalized gelatin for specific binding of proteins, protein microarrays, or an interlayer that does not interfere with protein microarray applications, the reference fails to anticipate the present claims. The Applicants request that the Examiner reconsider and withdraw the rejection.

Rejection Under 35 U.S.C. §102(b) over Bauer et al.:

The Examiner has rejected claims 1, 2, 6, 9 and 15 under 35 U.S.C. 102(b) as being anticipated by Bauer et al. (US Patent 5639589 - IDS entry 1/2112005). The Examiner maintains that Bauer teaches a polyethylene naphthalate film support comprising multiple layers including a gelatin adhesive layer and additional colored layers, also comprising gelatin. The Examiner indicates that, as is well known in the art and as evidenced by Schor et al. (1996 J. Cell Sci. 109:2581-2590), fibronectin is a protein which binds denatured collagen (a.k.a. gelatin), thus inherently, the entirety of the gelatin based film of Bauer would perform as a protein microarray element, reading on "a gelatin layer containing functional groups capable of binding biological probes". The Examiner continues that the adhesive gelatin layer of Bauer reads on "an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer" of claim 1 part (c), the gelatin adhesive interlayer of claim 6 (elected species) and claim 9. The polyethylene naphthalate film of Bauer reads on the support of claim 1 part (a) and the organic support of claim 2, and Bauer teaches that the gelatin layers are 2.44 g per square meter, reading on the microarray with gelatin coverage is 0.2 to 100 grams per square meter of claim 15. The Examiner indicates that the recitation "useful as a protein microarray" has not been given patentable weight because the recitation occurs in the preamble. The Examiner further indicates that Schor discloses a gelatin-agarose chromatography to affinity purify fibronectin expressed in insect cells. The Examiner states that according to Schor, gelatin acts as a specific binder for fibronectin and therein gelatin inherently bears functional groups capable of specific binding biological probes, such as fibronectin. The rejection is respectfully urged as in error as specific binding is not an inherent property of gelatin, and the reference fails to disclose a protein microarray.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications.

There are at least three patentably distinct aspects of the presently claimed invention not disclosed by Bauer. First, Bauer relates to a polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base and fails to disclose a protein microarray as claimed by the instant invention. Second, Bauer also fails to disclose an adhesive interlayer that does not optically interfere with protein microarray applications. Third, Bauer further fails to expressly disclose a gelatin layer containing functional groups capable of specific binding of biological probes, which would be useful as a protein microarray. Neither is the presence of functional groups in

gelatin an inherent property capable of specific binding of biological probes. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, illustrating the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. The present claims require specific binding, as a result of the functional groupings on the gelatin. With respect to the Examiners assertion that the phrase “useful as a protein microarray” has not been given patentable weight because the recitation occurs in the preamble, the claims now stand amended to include a protein microarray.

Since Bauer and Schor fail to teach, expressly or inherently, the use of a functionalized gelatin for specific binding of proteins, protein microarrays, or an interlayer that does not interfere with protein microarray applications, the reference fails to anticipate the present claims. The Applicants request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over any of Dorogushina et al.,
Himmelfmann et al. or Bauer et al. in view of Roberts et al.:**

The Examiner has rejected claims 1, 2, 6-12 and 15 under 35 U.S.C. 103(a) as being unpatentable over any of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892), Himmelfmann et al. (US Patent 3480431) or Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005), each taken separately, each in view of Roberts et al. (US Patent 5380642).

The Examiner maintains that the claimed invention is drawn to a protein microarray element comprising: a) a support; b) a gelatin layer containing functional groups capable of binding biological probes; and interposed between the support and the gelatin layer c) an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer. The Examiner further maintains that Dorogushina, teaches a cellulose acetate film comprising two layers: a gelatin sublayer to improve adhesion and a copying layer, also comprising gelatin, the improved adhesive gelatin sublayer of Dorogushina is taken to be an adhesive interlayer layer capable of maintaining contact with the

support and the gelatin layer. The Examiner indicates that Himmelmann teaches a cellulose acetate film comprising two layers: a gelatin adhesive layer applied with 3 % formalin and di-isobutyl naphthalic-sulfonate and a grey layer, also comprising gelatin, the adhesive gelatin layer of Himmelmann is taken to be an adhesive interlayer layer capable of maintaining contact with the support and the gelatin layer, and the cellulose acetate film of Himmelmann is taken to be the support. The Examiner states that Bauer teaches a polyethylene naphthalate film support comprising multiple layers including a gelatin adhesive layer and additional colored layers, also comprising gelatin, the adhesive gelatin layer of Bauer is taken to be an adhesive interlayer layer capable of maintaining contact with the support and the gelatin layer, and the polyethylene naphthalate film of Bauer is taken to be the support. The Examiner indicates that, as is well known in the art and as evidenced by Schor et al. (1996 J. Cell Sci. 109:2581-2590), fibronectin is a protein which binds denatured collagen (a.k.a. gelatin), thus inherently, the entirety of the gelatin based film of Dorogushina, Himmelmann or Bauer would perform as a protein microarray element, which is taken to be a gelatin layer containing functional groups capable of binding biological probes and, although none of Dorogushina, Himmelmann or Bauer teach an adhesive layer comprising polyacrylamide or a synthetic polymeric peptizer, Roberts, teaches the use of polyacrylamide based peptizers for gelatins, making it *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the polyacrylamide based peptizers in preparing the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer. In addition, the Examiner states that one of ordinary skill in the art would have been motivated to make and use the polyacrylamide based peptizers of Roberts with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer because the arrays would have had better resistance to bacterial decomposition and provided easier handling in non aqueous environments, as noted by Roberts in column 2, lines 35 and 45 and one of ordinary skill in the art could have used the polyacrylamide based peptizers of Roberts with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer with a reasonable expectation of success based on the many examples provided by Roberts.

In response to Applicants arguments the Examiner indicates that all of the elements are taught by the references, as discussed above. The Examiner states that the instant specification provides evidence that gelatin is a known non-specific binder as demonstrated in US Patent 6,797,393 however, the instant specification also states a gelatin modified surface effectively eliminates nonspecific protein binding, a teaching stemming from application 10/020747 (now US Patent 6,797,393). The Examiner asserts that if gelatin can act as an effective blocking agent, as taught in US Patent 6,797,393, the present invention does not represent a surprising result because one of ordinary skill in the art would not be dissuaded from using gelatin as part of an immobilization surface, for fear of adventitious protein binding, and in fact, as evidenced by Schor agarose-gelatin represents an effective means of purifying fibronectin recognized in the prior art, therein, absent evidence to the contrary, the gelatin of Dorogushina, Himmelmann and Bauer would similarly specifically immobilize fibronectin. This rejection is urged as in error as the references fail to teach a protein microarray as presently claimed.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Roberts relates in general to photography and in particular to the preparation of silver halide emulsions that are useful in photography. More specifically, this invention relates to a novel process for preparing a thin tabular grain silver halide emulsion by nucleating the silver halide grains with a gelatino-peptizer or with the use of certain synthetic polymers that serve as effective

nucleation peptizers and then growing the silver halide grains with the use of either a gelatino-peptizer or certain synthetic polymers that serve as effective growth peptizers.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. As discussed above, none of Dorogushina, Himmelmann and Bauer, alone or combined with Schor, teach a protein microarray, an adhesive interlayer that does not optically interfere with protein microarray applications, or a gelatin layer containing functional groups capable of specific binding of biological probes. Roberts also fails to teach or suggest these limitations. None of the references relate to protein microarrays, none of the references teach an adhesive interlayer that does not optically interfere with protein microarray

applications, and none of the references teach a gelatin layer containing functional groups capable of specific binding of biological probes as presently claimed.

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The present claims require specific binding, as a result of the functional groupings on the gelatin, and an adhesive interlayer that does not optically interfere with protein microarray applications. Himmelmann, Dorogushina and Bauer, with Schor, and in light of Roberts, fail to disclose the use of a functionalized gelatin for specific binding of proteins or an adhesive interlayer that does not optically interfere with protein microarray applications as presently claimed. Therefore, the references fail to disclose all of the limitations of the present claims.

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Pat. No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in

combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

Rejection Under 35 U.S.C. §103(a) over any of Dorogushina et al.,

Himmelmann et al. or Bauer et al. in view of Arenkov et al.:

The Examiner has rejected claims 1-6, 9-12 and 15 under 35 U.S.C. 103(a) as being unpatentable over any of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892), Himmelmann et al. (US Patent 3480431) or Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005), each taken separately, each in view of Arenkov et al. (2000 Analytical Biochemistry 278:123-131- IDS entry 11/10/2003 transferred to PTO-892).

The Examiner maintains that as claim 3 limits the support to glass or fused silica, claim 4 limits the substrate thickness to between 0.1 and 5 mm, claim 5 limits the support to thickness to between 0.5 and 2.0 mm, claim 12 includes the limitation that the adhesive layer comprise a crosslinker, but Dorogushina, Himmelmann, and Bauer are relied on as above and, although none of Dorogushina, Himmelmann or Bauer teach glass slide substrates, with a substrate thickness between 0.1 and 2.0 mm, or the introduction of a crosslinker however, Arenkov, teaches throughout the publication, and especially page 124 under subheading Fabrication of gel micromatrices, the use of a Corning Micro Slide, which is taken to be the glass support of claim 3 and further taken to be the inorganic support of claim 2, as evidenced by the Fisher Scientific Catalog (a printout from the on-line version is included with this Office Action), said slides are between 0.9 and 1.1 mm, which is taken to be in range the set forth in both claims 4 and 5. Arenkov also teach the use of bisacrylamide as a crosslinker, making it *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the Corning Micro Slide and employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer, as one of ordinary skill in the art would have been motivated to use the Corning Micro Slide and employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer because the transparency of the slides and resulting

polymer comprising bisacrylamide crosslinker would have afforded the ability to perform fluorescence, as noted by Arenkov in Figure 1, making the microarrays more versatile and one of ordinary skill in the art could have used the Corning Micro Slide employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer with a reasonable expectation of success since derivatization of glass slides is very well known in the art.

In response to Applicants arguments the Examiner indicates that all of the elements are taught by the references, as discussed above. The Examiner states that the instant specification provides evidence that gelatin is a known non-specific binder as demonstrated in US Patent 6,797,393 however, the instant specification also states a gelatin modified surface effectively eliminates nonspecific protein binding, a teaching stemming from application 10/020747 (now US Patent 6,797,393). The Examiner asserts that if gelatin can act as an effective blocking agent, as taught in US Patent 6,797,393, the present invention does not represent a surprising result because one of ordinary skill in the art would not be dissuaded from using gelatin as part of an immobilization surface, for fear of adventitious protein binding, and in fact, as evidenced by Schor agarose-gelatin represents an effective means of purifying fibronectin recognized in the prior art, therein, absent evidence to the contrary, the gelatin of Dorogushina, Himmelmann and Bauer would similarly specifically immobilize fibronectin. This rejection is urged as in error as the references fail to teach a protein microarray as presently claimed.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester

photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Arenkov relates to the use of a modified polyacrylamide gel in a protein microchip.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. As discussed above, none of Dorogushina, Himmelmann and Bauer, alone or combined with Schor, teach a protein microarray, an adhesive interlayer that does not optically interfere with protein microarray applications, or a gelatin layer containing functional groups capable of specific binding of biological probes. Arenkov also fails to teach or suggest these limitations. In fact Arenkov teaches a polyacrylamide gel layer and not the use of a gelatin layer containing functional groups capable of specific binding of biological probes as

claimed by the instant invention. None of the references relate to protein microarrays, none of the references teach an adhesive interlayer that does not optically interfere with protein microarray applications, and none of the references teach a gelatin layer containing functional groups capable of specific binding of biological probes as presently claimed.

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Arenkov provides no likelihood of success with the use of gelatin, as the reference teaches the use of a polyacrylamide gel layer. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The present claims require specific binding, as a result of the functional groupings on the gelatin, and an adhesive interlayer that does not optically interfere with protein microarray applications. Himmelmann, Arenkov, Dorogushina and Bauer, with Schor, fail to disclose the use of a functionalized gelatin for specific binding of proteins or an adhesive interlayer that does not optically interfere with protein microarray applications as presently claimed. Therefore, the references fail to disclose all of the limitations of the present claims.

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Pat. No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin

for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over any of Dorogushina et al.,
Himmelman et al. or Bauer et al. in view of Christopher:**

The Examiner has rejected claims 1, 2, 6, 9-13, and 15 under 35 U.S.C. 103(a) as being unpatentable over any of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892), Himmelman et al. (US Patent 3480431) or Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005), each taken separately, each in view of Christopher (US Patent 2309340). The Examiner maintains that as claim 13 limits the gelatin to being alkaline pretreated and Dorogushina, Himmelman, and Bauer are relied on as above, and, although none of Dorogushina, Himmelman or Bauer teach alkaline pretreated gelatin, Christopher teaches alkaline pretreatment of gelatin, making it *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the alkaline pretreated gelatin of Christopher in making the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelman or Bauer, as one of ordinary skill in the art would have been motivated to use the alkaline pretreated gelatin of Christopher in making the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelman or Bauer because the alkaline pretreatment would have enhanced the adhesive (glue-like) properties of the gelatin, as noted by Christopher and one of ordinary skill in the art could have used the alkaline pretreated gelatin of Christopher with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelman or Bauer with a reasonable expectation of success since the advantage of alkaline pretreatment of gelatin has been appreciated in this and other arts for some time.

In response to Applicants arguments the Examiner indicates that all of the elements are taught by the references, as discussed above. The Examiner states that the instant specification provides evidence that gelatin is a known non-specific binder as demonstrated in US Patent 6,797,393 however, the instant specification also states a gelatin modified surface effectively eliminates nonspecific protein binding, a teaching stemming from application 10/020747 (now US Patent 6,797,393). The Examiner asserts that if gelatin can act as an effective blocking agent, as taught in US Patent 6,797,393, the present invention does not represent a surprising result because one of ordinary skill in the art would not be dissuaded from using gelatin as part of an immobilization surface, for fear of adventitious protein binding, and in fact, as evidenced by Schor agarose-gelatin represents an effective means of purifying fibronectin recognized in the prior art, therein, absent evidence to the contrary, the gelatin of Dorogushina, Himmelmann and Bauer would similarly specifically immobilize fibronectin. This rejection is urged as in error as the references fail to teach a protein microarray as presently claimed.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Christopher relates to a method of extracting gelatinous material from gelatinous material stock such as hide trimmings, fleshings, sinews, and the like.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of

specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. As discussed above, none of Dorogushina, Himmelmann and Bauer, alone or combined with Schor, teach a protein microarray, an adhesive interlayer that does not optically interfere with protein microarray applications, or a gelatin layer containing functional groups capable of specific binding of biological probes. Christopher also fails to teach or suggest these limitations. Christopher fails to teach or suggest an adhesive interlayer that does not optically interfere with protein microarray applications as presently claimed. None of the references relate to protein microarrays, none of the references teach an adhesive interlayer that does not optically interfere with protein microarray applications, and none of the references teach a gelatin layer containing functional groups capable of specific binding of biological probes as presently claimed.

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific

binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The present claims require specific binding, as a result of the functional groupings on the gelatin, and an adhesive interlayer the does not optically interfere with protein microarray applications. Himmelmann, Dorogushina and Bauer, with Schor, and in light of Christopher, fails to disclose the use of a functionalized gelatin for specific binding of proteins or an adhesive interlayer the does not optically interfere with protein microarray applications as presently claimed. Therefore, the references fail to disclose all of the limitations of the present claims.

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Pat. No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

The references cited by the Examiner comprise non-analogous art. In order to rely on a reference as a basis for rejection of Applicant's invention, a reference must either be in the field of the Applicant's endeavor or reasonably pertain to the particular problem with which the invention is concerned. Here, the cited references are not in Applicant's field of endeavor, that is, a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the

gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. No reference cited addresses protein microarrays. Furthermore, Christopher discloses a method of extracting gelatinous material from stock, and fails to disclose any information relating to protein microarrays. Christopher further fails to disclose an adhesive interlayer as claimed by the instant invention. Christopher relates to a method for preparing glue from gelatinous material and not to the field of protein microarrays.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, comprise non-analogous art, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over any of Dorogushina et al.,
Himmelmann et al. or Bauer et al. in view of Bonderman:**

The Examiner has rejected claims 1, 2, 6, 9-12 and 14 under 35 U.S.C. 103(a) as being unpatentable over either of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892), Himmelmann et al. (US Patent 3480431) or Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005), each taken separately, in view of Bonderman (US Patent 5348852). The Examiner maintains that since Dorogushina, Himmelmann, and Bauer are relied on as above and, although none of Dorogushina, Himmelmann or Bauer teach pig or fish gelatin, Bonderman teach pig and fish gelatin, making it *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the fish gelatin of Bonderman in making the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer, as one of ordinary skill in the art would have been motivated to use the fish gelatin of Bonderman with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer because fish gelatin had been shown to better stabilize enzymes, giving the arrays a better shelf life and one of ordinary skill in the art could have used the fish gelatin of Bonderman with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer with a reasonable

expectation of success since Bonderman provides examples from two different enzyme classes.

In response to Applicants arguments the Examiner indicates that all of the elements are taught by the references, as discussed above. The Examiner states that the instant specification provides evidence that gelatin is a known non-specific binder as demonstrated in US Patent 6,797,393 however, the instant specification also states a gelatin modified surface effectively eliminates nonspecific protein binding, a teaching stemming from application 10/020747 (now US Patent 6,797,393). The Examiner asserts that if gelatin can act as an effective blocking agent, as taught in US Patent 6,797,393, the present invention does not represent a surprising result because one of ordinary skill in the art would not be dissuaded from using gelatin as part of an immobilization surface, for fear of adventitious protein binding, and in fact, as evidenced by Schor agarose-gelatin represents an effective means of purifying fibronectin recognized in the prior art, therein, absent evidence to the contrary, the gelatin of Dorogushina, Himmelmann and Bauer would similarly specifically immobilize fibronectin. This rejection is urged as in error as the references fail to teach a protein microarray as presently claimed.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Bonderman relates to improved compositions such as medical and diagnostic compositions, and to methods of their preparation and use. The improved compositions are highly stable and have desirable physical and

chemical properties. The compositions comprise an effective amount of gelatin from cold water fish skin as a protein base.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. As discussed above, none of Dorogushina, Himmelmann and Bauer, alone or combined with Schor, teach a protein microarray, an adhesive interlayer that does not optically interfere with protein microarray applications, or a gelatin layer containing functional groups capable of specific binding of biological probes. Bonderman also fails to teach or suggest these limitations. None of the references relate to protein microarrays, none of the references teach an adhesive interlayer that does not optically interfere with protein microarray applications, and none of the references teach a gelatin layer containing functional groups capable of specific binding of biological probes as presently claimed.

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes. In addition, Bonderman is associated with a fish gelatin. The benefits of this gelatin appear to be its labile nature and its resistance to gelatin. See col. 1, lines 54-56; see also col. 2, lines 26-29. The present invention utilizes at least one layer of gelatin. The gelatin of Bonderman would not produce a layer of gelatin on the support. See col. 5, lines 53-55. Bonderman only teaches using fish gelatin that remains ungelled and does not teach utilizing a layered structure. If fish gelatin were used as taught by Bonderman in conjunction with the other references, no layer structure would be produced, rendering the references inoperable for their intended uses.

The present claims require specific binding, as a result of the functional groupings on the gelatin, and an adhesive interlayer the does not optically interfere with protein microarray applications. Himmelmann, Dorogushina, and Bauer, with Schor, and in light of Bonderman, fails to disclose the use of a functionalized gelatin for specific binding of proteins or an adhesive interlayer the does not optically interfere with protein microarray applications as presently claimed. Therefore, the references fail to disclose all of the limitations of the present claims.

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Pat. No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material.

Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

Rejection Under 35 U.S.C. §103(a) over any of Dorogushina et al., Himmelmann et al. or Bauer et al. in view of Arenkov et al., and further in view of Cone et al.:

The Examiner has rejected claims 16 and 28 under 35 U.S.C. 103(a) as being unpatentable over any of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892), Himmelmann et al. (US Patent 3480431) or Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005), each taken separately, each in view of Arenkov et al. (2000 Analytical Biochemistry 278:123-131- IDS entry 11/10/2003 transferred to PTO-892) as applied to claims 1,2,6,9-12,15 and 3-5 above, and further in view of Cone et al. (US Patent 2235202). The Examiner indicates that any of Dorogushina, Himmelmann, and Bauer in view of Arenkov are relied on as discussed above. The Examiner states that any of Dorogushina, Himmelmann, and Bauer in view of Arenkov do not teach a silicate salt, and also do not teach a gelatin layers 10 to 50 grams per square meter, as set forth in claim 16. The Examiner indicates that Cone teaches, throughout the document and especially p1, paragraphs 1-2 glue made from collagen and various tannins. The Examiner states that Cone teaches in claim 10, the use of an alkali metal silicate, which is taken as the silicate salt of claims 12 and 28 (c). The Examiner further states that it would have been prima facie obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the Corning Micro Slide and employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer and incorporate the silicate salt per Cone. The Examiner indicates that one of ordinary skill in the art would

have been motivated to use the Corning Micro Slide and employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer and incorporate the silicate salt per Cone because it would improve the adhesive qualities of the gelatin, as noted by Cone in column 1, line 20. The Examiner states that in so far as the gelatin layers being 10 to 50 grams per square meter, generally, differences in concentration will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration is critical. The Examiner states that one of ordinary skill in the art could have used the Corning Micro Slide employing bisacrylamide as a crosslinker of Arenkov with the gelatin based films capable performing as protein microarrays of Dorogushina, Himmelmann or Bauer and incorporate the silicate salt per Cone with a reasonable expectation of success since the glue of Cone lies well within the scope of the gelatin technology of each of Dorogushina, Himmelmann or Bauer. This rejection is urged as in error as the references fail to teach a protein microarray as presently claimed.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

As used by the Examiner, Schor discloses that fibronectin is a protein, which binds denatured collagen (a.k.a. gelatin).

Himmelmann relates to a photographic material for a dry copying process, which material contains a uniformly dyed layer and an azopyrazolone.

Bauer relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Arenkov relates to the use of a modified polyacrylamide gel in a protein microchip.

Cone relates to glue and the process of manufacturing glue utilizing tannins found in oak bark, hemlock bark, pine bark, chestnut wood,

quebracho, and a large variety of other vegetable origins as a reagent for use in extending flues made from collagen.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications. The present invention also relates to a protein microarray element comprising a support, a gelatin layer containing functional groups capable of specific binding of biological probes and, interposed between the support and the gelatin layer, an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer, wherein said adhesive interlayer layer comprises gelatin, at least one organic solvent, a crosslinking agent, and a silicate salt, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. As discussed above, none of Dorogushina, Himmelmann and Bauer, alone or combined with Schor in view of Arenkov, teach a protein microarray, an adhesive interlayer that does not optically interfere with protein microarray applications, or a gelatin layer containing functional groups capable of specific binding of biological probes. Cone also fails to teach or suggest these limitations. None of the references relate to protein microarrays, none of the references teach an adhesive interlayer that does not optically interfere with protein microarray applications, and none of the references teach a gelatin layer

containing functional groups capable of specific binding of biological probes as presently claimed.

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Pat. No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The present claims require specific binding, as a result of the functional groupings on the gelatin, and an adhesive interlayer the does not optically interfere with protein microarray applications. Himmelmann, Dorogushina and Bauer, with Schor, and in view of Arenkov and in further in view of Cone fail to disclose the use of a functionalized gelatin for specific binding of proteins or an adhesive interlayer the does not optically interfere with protein microarray applications as presently claimed. Therefore, the references fail to disclose all of the limitations of the present claims.

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Pat. No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.


The references cited by the Examiner comprise non-analogous art. In order to rely on a reference as a basis for rejection of Applicant's invention, a reference must either be in the field of the Applicant's endeavor or reasonably pertain to the particular problem with which the invention is concerned. Here, the

cited references are not in Applicant's field of endeavor, that is, a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. No reference cited addresses protein microarrays. Furthermore, Cone discloses glues made from tannins suitable for gluing wood, and fails to disclose any information relating to protein microarrays.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, comprise non-analogous art, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited. In the alternative, Applicants respectfully request that this amendment be admitted in order to present the rejected claims in better form for consideration on appeal.

Respectfully submitted,


Attorney for Applicant(s)
Registration No. 42,334

Lynne M. Blank/ct
Rochester, NY 14650
Telephone: 585-477-7418
Facsimile: 585-477-1148

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.